

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch  
690 Walnut Ave.St. 150  
Vallejo, CA 94592-1133  
(707) 649-5453  
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:**Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-021727**Date Inspected:** 09-Mar-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 700**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** See Items Observed**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** Orthotropic Box Girders**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

- A). Field Splice W4/W5
- B). Deck Access Hole
- C). Field Splice W10/W11
- D). QC Inspection Request
- E). QAI UT Verification
- F). Pipe Welding

A). Field Splice W4/W5

The QAI observed the continued welding to correct the excessive root opening of the longitudinal stiffener located at the field splice W4/W5 identified as WN: 4W-5W-A-LS 3. The welding was performed by Hua Qiang Hwang ID-2930 utilizing the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. The QAI also observed the Complete Joint Penetration (CJP) welding of the longitudinal stiffener field splice identified as WN: 4W-5W-A-LS 5. The welding was performed by Hua Qiang Hwang ID-2930 and Xiao Jin Wan ID-9677 utilizing the Shielded Metal Arc Welding (SMAW) process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. The WPS was also utilized by the QC inspector Gary Ehrsom as a reference to monitor the welding operation and verify the welding parameters. The average amperage was observed by the

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QAI and recorded by the QC inspector as 123 amps.

The welders utilized the 3.2 mm electrode and the welding was performed in the vertical (3G) position with the work placed in an approximate vertical plane and the groove approximately vertical. The minimum preheat temperature of 100 degrees Celsius and the interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The welders utilized a slag hammer and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from the sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 120 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no issues were noted by the QAI.

### B). Deck Access Hole

The QAI observed the welder Jorge Lopez ID-6149, perform the CJP welding of the Deck Access Hole (DAH) located Panel Point 37.5 identified as WN: 5E-PP37.5-E5-NW. The welding and QC inspection was performed utilizing the WPS identified as ABF-WPS-D15-1010, Rev. 1. The WPS was also utilized by the QC inspector Mr. McConnell as a reference to monitor the welding operation and verify the welding parameters. The amperage was observed by the QAI and recorded as 143 amps. The welder utilized the 4.0 mm electrode and performed in the flat (1G) position with the work placed in an approximate horizontal plane and the weld metal deposited from above. The minimum preheat temperature of 10 degrees Celsius and the interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The welder utilized a slag hammer and a wire wheel attached to a 4" high cycle grinder to remove slag after deposit of each fill pass. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from the sealed containers. The exposure limits of the electrodes identified as E7018-H4R and the minimum storage oven temperature of 120 degrees Celsius appeared to be in compliance with the contract documents. At the time of the observation no issues were noted by the QAI. The QAI randomly observed the QC inspector, Steve McConnell, perform the weld inspection, verify the welding parameters and the preheat and interpass temperatures during the welding operation and appeared to comply with the contract specifications.

### C). Field Splice W10/W11

The QAI observed the continuous tack welding of the bottom plate field splice identified as WN: 10W-11W-D1 and D2. The welding was performed by the welders Wai Kitlai ID-2953 and Hua Qiang Hwang ID-2930 utilizing the Flux Cored Arc Welding (FCAW) process as per the Welding Procedure Specification (WPS) ABF-WPS-D15-F3200A. The average welding parameters were verified and recorded as 271 amps, 25.4 volts and a travel speed measured as 347 mm/m. The WPS was also utilized by the QC inspector, William Sherwood, as a reference to verify the amperage and to monitor the welding. The minimum preheat temperature of 20 degrees Celsius and the interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. At the time of the observation no issues were noted by the QAI.

### D). QC Inspection Request

At the request of Quality Control Field Supervisor, Bonifacio Daquinag, the QAI randomly verified the QC visual inspection of the Complete Joint Penetration (CJP) welding of the following; WN: 3W-4W-A-LS1, LS2, LS3 and

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WN: 3W-PP23.5-W2-LSE and LSW. The QAI verification was performed to verify that the welding and the visual weld inspection performed by the QC inspector meet the requirements of the contract documents. At the conclusion of the QAI verification it appeared that the welds and the QC inspection complies with the contract documents.

### E). QAI Verification

The QAI performed a random Ultrasonic Test (UT) and Magnetic Particle Test (MPT) of the Complete Joint Penetration (CJP) groove welds identified as WN: 3W-4W-A-LS1, LS2, LS3 and WN: 3W-PP23.5-W2-LSE and LSW. A total area of approximately 10% was tested to verify the weld and the testing performed by QC meet the requirements of the contract documents. A UT and MPT report identified as TL-6027 and TL-6028 were generated on this date.

### F). Piping

The QAI observed the welder, Rick Kiikvee-ID-5319, perform the Complete Joint Penetration (CJP) welding of the field pipe splice of the 2.5 " and 4" utility and compressed air lines at the W2E1 pier column located at the grade elevation. The welding was performed utilizing the Weld Procedure Specification (WPS) identified as 1-12-1 which was also utilized by the QC inspector, Steve Jensen, to monitor the welding and to verify the welding parameters. The QC inspector verified the welding parameters and were observed as 69 amps.

Later in the shift, at the request of the QC inspector, the QAI performed a Visual Verification of the following pipe welds; 9-4-W2-E, 9-2.5-W2-E, 4-4-W2-E, 4-2.5-W2-E, 5-2.5-W2-E and 4-2.5-W2-E. At the conclusion of the visual observation the welding appeared to comply with the contract specifications.

### QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspectors utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW welding process appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

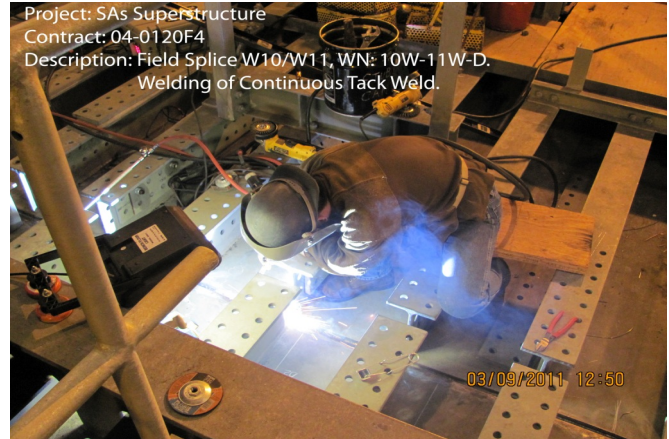
The digital photographs on page 4 of this report illustrate some of the work observed during this scheduled shift.

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### Summary of Conversations:

There were general conversations with Senior Quality Control Inspector, Bonifacio Daquinag, Jr., at the start of the shift regarding the location of American Bridge/Fluor welding, inspection and N.D.E. testing personnel scheduled for this shift.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy (510) 385-5910, who represents the Office of Structural Materials for your project.

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**Inspected By:** Reyes,Danny

Quality Assurance Inspector

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**Reviewed By:** Levell,Bill

QA Reviewer